

Appl. No. 09/137,393
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Reply to Final Office Action of July 16, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-29 (previously canceled)

Claim 30. (currently amended) A golf ball comprising:

- (a) a core ~~having a core compression~~; and
- (b) a ~~finished golf ball~~ cover formed essentially free of catalysts over said core in a single molding operation by casting, that when cured at room temperature having said cover has a Shore D hardness of 50D to 65D, wherein said cover is produced through a mixture having a stoichiometry of 92 to 105% comprising of

(1) a diisocyanate ~~wherein said diisocyanate is selected from a group consisting of toluene diisocyanate, 4,4'-diphenylmethane diisocyanate, Isophorone diisocyanate and mixtures thereof;~~

(2) a polyol having a molecular weight of about 650-3000 wherein the diisocyanate and the polyol when mixed

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have an NCO% content by weight from about 5.5% to about

8.0% ~~said polyol is an ether glycol; and,~~

(3) a curing agent blend consisting of:

(A) a first diamine having sterically or electronically hindered amine groups ~~dimethylthio 2,4-toluenediamine; and,~~

(B) a second diamine having unhindered diamine groups. ~~diethyl 2,4-toluenediamine~~

~~wherein said mixture is poured into a pair of mating mold halves, said mixture forms a semi-gelled polyurethane, wherein said core is inserted into said semi-gelled polyurethane, the mating mold halves are joined to form a golf ball, after the golf ball is removed the golf ball is allowed to cure at room temperature to preserve the core compression.~~

Claim 31. (currently amended) The golf ball of claim 30 wherein the diisocyanate is selected from the group consisting of toluene diisocyanate, 4,4'-diphenylmethane diisocyanate, Isophorone diisocyanate and mixtures thereof.

Claim 32. (previously presented) The golf ball of claim 30 wherein the diisocyanate is toluene diisocyanate, the

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polyol is polyoxytetramethylene ether glycol forming a prepolymer having an NCO content of about 6%, which when mixed with the curing agent forms a pot life of 55-70 seconds.

Claim 33. (currently amended) The golf ball of claim 30 wherein the ~~ratio of said first diamine is dimethylthio-2,4-toluenediamine to said second diamine is selected from the group of ratios consisting of 40:60, 50:50, 70:30 and 80:20.~~

Claims 34-35 (Canceled)

Claim 36. (previously presented) The golf ball of claim 30 wherein the core is comprised of cis polybutadiene rubber.

Claim 37 (currently amended) The golf ball of claim 36 wherein the core comprises a center made from cis polybutadiene rubber and thread windings having an initial compression value and a post cure compression value that is about the same value as the initial compression value.

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Claim 38. (previously presented) The golf ball of claim 37 wherein the center has a diameter from about 1.40" to about 1.53".

Claim 39. (currently amended) The golf ball of claim 38 ~~wherein the thread windings are polyisoprene rubber~~ 30 wherein the second diamine is diethyl-2,4-toluenediamine.

Claim 40. (currently amended) A golf ball comprising:
a core ~~having a core compression~~, comprising a center and thread layer wherein said core has a diameter from about 1.48" to about 1.62"; and,
a polyurethane cover free of catalysts having a Shore D hardness of 50D to 65D formed from a mixture of reactants poured into at least one pair of mating mold halves, wherein the mixture of reactants produce a semi-gelled polyurethane, wherein the core is introduced into at least one of the pair of mating mold halves containing the semi-gelled polyurethane, which after waiting approximately four minutes ~~forms a golf ball that cures~~ can be removed and cured at room temperature ~~to preserve the core compression~~, wherein the reactants comprise:

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(a) (1) a diisocyanate selected from the group consisting of toluene diisocyanate, 4,4'-diphenylmethane diisocyanate, isophorone diisocyanate and mixtures thereof, and

(2) ~~an ether glycol~~ a polyol having a molecular weight of about 650-3000; and,

(b) a curing agent comprising:

- (1) dimethylthio-2,4-toluenediamine; and,
- (2) diethyl-2,4-toluenediamine.

Claim 41. (previously presented) The golf ball of claim 40 wherein the polyol is polyoxytetramethylene ether glycol.

Claim 42. (canceled)

Claim 43. (previously presented) A polyurethane golf ball molding assembly comprising:

~~a center comprising 100 PPHR cis polybutadiene rubber, 20 PPHR zinc acrylate salt, 24.5 PPHR barium sulfate, 6 PPHR zinc oxide, 3 PPHR zinc stearate and 2.1 PPHR 1,1-di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane,~~

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~~a thread layer winding comprised of polyisoprene rubber, wherein said thread layer forms~~

~~a core having a core compression; and~~

at least one pair of mating mold halves wherein the mold halves produce finished golf balls;

a cast golf ball cover disposed over the core formed from ~~reactants~~ a mixture poured into the pair of mating mold halves, the ~~cast golf ball cover mixture~~ when cured having a Shore D hardness of 50D to 65D ~~wherein the reactants comprise 100 PPHR of toluene~~ wherein the mixture comprises a diisocyanate and a polyol polyoxytetramethylene ether glycol that forms a prepolymer with an NCO content of about 5.5% to 8.0% by weight of said prepolymer, said prepolymer is further reacted with 13.2 PPHR of and a curative comprising diethyl-2,4-toluenediamine and dimethylthio-2,4-toluenediamine, at a 50:50 weight ratio and 2.3 PPHR pigment when the reactants which are mixed and poured into [[a]] the pair of mating mold halves, the reactants form forming a semi-gelled polyurethane in one of the pair of mold halves, wherein the core is inserted into the semi-gelled polyurethane and the core is completely engulfed by the semi-gelled polyurethane when the pair of mating mold halves are joined and engulf the core in the

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~~semi-gelled polyurethane; when the mold halves are opened a
golf ball is removed and allowed to cure at room
temperature to preserve the core compression.~~

Claim 44. (currently amended) A cast polyurethane golf
ball molding system comprising:

(a) a core ~~having a core compression~~; and

(b) a cover having a Shore D hardness of 50D to 65D
after curing for 8 to 16 hours at room temperature, said
cover being a polyurethane formed from a mixture of
reactants comprising:

(1) a diisocyanate selected from the group
consisting of toluene diisocyanate, 4,4'-diphenylmethane
diisocyanate, Isophorone diisocyanate and mixtures thereof;

(2) a polyol ~~having ether groups~~, wherein said
polyol has a molecular weight of about 650-3000; and,

(3) a curing agent comprising:

(A) a first diamine substituted benzene ring
wherein said first diamine substituted benzene ring has
amine groups which are sterically or electronically
hindered; and,

(B) a second diamine substituted benzene
ring having no interference with its amine group, wherein

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said first diamine substituted benzene ring has greater hindrance of its amine group than said second diamine substituted benzene ring's amine group;

(c) at least one pair of mating mold halves wherein said mold halves produce finished golf balls, wherein the mixture of reactants is poured into [[a]] the pair of mating mold halves, ~~the reactants form a semi-gelled polyurethane into which the core is inserted, the mold halves are mated engulfing the core in the mixture that semi-gelled polyurethane, when the mold halves are separated the golf ball is complete and is capable of being cured at room temperature after removal from the mating mold halves to preserve the core compression without reduced properties.~~

Claim 45. (previously presented) The golf ball according to claim 44 wherein said first diamine substituted toluene is dimethylthio-2,4-toluenediamine.

Claim 46. (previously presented) The golf ball according to claim 44 wherein said second diamine substituted toluene is diethyl-2,4-toluenediamine.

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Claim 47. (previously presented) The golf ball according to claim 45 wherein said second substituted toluene diamine is diethyl-2,4-toluenediamine.

Claim 48. (currently amended) A golf ball comprising:

a core ~~having a core compression;~~

a cover comprising a blend of:

(a) a polyurethane prepolymer comprising:

(1) a diisocyanate having a benzene ring group;

(2) a polyol;

(b) a curing agent comprising:

(1) a benzene ring having a hindered diamine;

and,

(2) a benzene ring having an unhindered diamine;

wherein the polyurethane prepolymer and curing agent are

~~post-cured at a post-cure temperature of~~ cured at about 72°

F to about 102°F, and a post-cure time for the golf ball is

between about 8 to 16 hours ~~wherein the core compression is~~

~~preserved during the post-cure.~~

Claim 49. (previously presented) The golf ball of claim 48 wherein said cover blend has a pot life of 55-70 seconds.

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Claim 50. (previously presented) The golf ball of claim 48 wherein said polyol is an ether glycol.

Claim 51. (previously presented) The golf ball of claim 48 wherein said diisocyanate is selected from the group consisting of toluene diisocyanate, 4,4'-diphenylmethane diisocyanate, Isophorone diisocyanate and mixtures thereof.

Claim 52. (previously presented) The golf ball of claim 51 wherein the polyol is polyoxytetramethylene ether glycol.

Claim 53 (new) The golf ball of claim 48 wherein the core comprises a center and a thread winding layer, wherein the thread winding layer is sprayed with a polyurethane based liquid.

Claim 54 (new) A golf ball having a cast polyurethane cover formed in a single molding operation cycle comprising:

a core; and,

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a cast polyurethane cover having a Shore D hardness of about 50D to 65D and a flexural modulus of about 15,000 PSI to about 30,000 PSI, the cover comprising a mixture of:

- (a) a prepolymer comprising:
 - (1) a diisocyanate; and,
 - (2) a polyol, wherein said diisocyanate and said polyol have about 5.5% to 8.0% by weight of NCO% content;
- (b) a curing agent blend comprising:
 - (1) a first diamine substituted toluene having amine groups that are sterically or electronically hindered;
 - (2) a second diamine substituted toluene having amine groups, wherein said first diamine substituted toluene has greater hindrance of its amine group than said second substituted toluene diamine's amine group;

wherein said mixture has a pot life of about 55 to 70 seconds, and cures in about 8 to 16 hours at a temperature of about 72F to 102F degrees.

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Claim 55. (new) A golf ball comprising:

a core having a diameter of about 1.48" to 1.62";

a polyurethane cover comprising

(a) a prepolymer comprising

(1) a diisocyanate;

(2) a polyol;

(b) a curing agent blend consisting essentially of

(1) diethyl-2,4-toluenediamine; and,

(2) an unhindered diamine.

Claim 56. (new) The golf ball according to claim 55,
wherein the polyurethane cover cures in about 8 to 16 hours
at a temperature of 72F to 102F degrees.

Claim 57. (New) The golf ball according to claim 55,
wherein the polyurethane cover further comprises titanium
dioxide, UV stabilizer and optical brighteners.

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Claim 58. (new) A golf ball comprising:

a core;

a cover comprising a blend of:

a polyurethane produced in a one-shot process
comprising:

- (1) a diisocyanate having a benzene ring group;
- (2) an ether glycol polyol;
- (3) a curing agent blend comprising:
a polyol; and,
an unhindered diamine;

wherein the polyurethane is cured at about 72° F to about
102°F, and a post-cure time for the golf ball is between
about 8 to 16 hours.